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account. From the systematic march of the errors, I should be inclined to suppose them due to perturbation.

"I will avail myself of the present opportunity to make a remark on the construction of my ephemeris of *Victoria.* The linear co-ordinates of the sun, taken from the *Nautical Almanac*, have been, as I have mentioned elsewhere, corrected for the terms depending on the sun's latitude. But M. Schumacher communicated to me a remark made by M. Götze, that these co-ordinates have been calculated with a radius vector of the earth, *affected with aberration.* I have only attended to this remark in that part of the ephemeris which belongs to the first three months of 1851. The rectilineal co-ordinates of the sun are so very convenient in use that it is desirable the superintendent should take the preceding remark into consideration; since the *Nautical Almanac* is a work which every astronomer must daily use, and whose merits every astronomer must highly appreciate."

Observations of the Planet Saturn with the 20-foot Equatoreal.

By Mr. Lassell.

"*September* 9, 11½ p.m. The phenomena of *Saturn* were extremely well shown, the air being in an unusually fine state, though some unsteadiness still remained. Power 430. The division of the ring easily visible along the whole of that part of the ring between us and the ball. No other division could be made out certainly. The more dusky surface of the exterior ring gave a striped impression, but no certain line. The 'veil' extended exactly half way from the inner boundary of the inner ring to the nearest edge of the ball. The termination of it was well defined towards the ball, and the sky within it perfectly black, as much so as any part of the sky. But the exterior boundary, though pretty well defined, was less so than the interior; and beyond its evident termination there was a faint but very evident shade upon the ring. No difference in depth of shade of the 'veil' could be suspected, and certainly no dark division separating it into two, neither could any darker division be made out between the 'veil' and the bright ring. Once, for an instant, I suspected a darker boundary, but the impression did not return. Certainly the planet is seen to-night to such advantage, that, if such divisions exist, I think I ought to see them. The shadow of the ball on the ring seemed to be bounded by a straight, not a curved line—or if curved at all, it is concave towards the ball. I could not well trace the dark shade crossing the ball in a continuous line to the dark shade within the ring—it seemed as if the sky dipped down into it, then encroaching upon it and reducing its breadth at those points where the planet's limb touches (apparently) the ring. The faint shading on the bright ring may be traced (growing gradually fainter) to within less than the breadth of the exterior ring of its outer circumference. The

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satellite *Mimas* was steadily seen, even when considerably past his greatest western elongation.

" *September* 10. I surveyed *Saturn* from $11\frac{1}{2}^h$ to 13^h with various powers, *e.g.* 366, 430, 614, and 864, the air being occasionally remarkably fine, so as to exceed the atmosphere of last night, and give me the most exquisite glimpses of the phenomena of the planet. The drawing which accompanies this paper is the most faithful picture I have been able to execute of the appearances which presented themselves. I am confirmed in my impression that there is no difference in the deepness of the shade of the dusky ring or 'veil'—that it is not obviously separated into two, and that there is no black line or division of sensible breadth separating it from the bright ring. The breadth of the veil, where it crosses the planet, is about the breadth of the inner bright ring at the same point—it ought to be not quite so broad, but the lighter shading on the interior portion of the inner bright ring may modify the judgment. The shadow of the ball on the ring is *slightly* concave towards the ball; nothing extraordinary in the *shape* of the shadow.

" I had many sharp glimpses of the outer ring, even with the high powers, and its outline was perfectly sharp and distinct; but no positive division could anywhere be traced, notwithstanding that this was, taken altogether, the most powerful view of *Saturn* I ever had. The plane of the exterior ring was strongly shaded parallel to its circumference, so as to give an impression of divisions; but I believe they were not real—only markings on the surface. The satellites *Mimas* and *Enceladus*, seen in the positions depicted in the drawing, strongly show the power of the telescope and the goodness of the circumstances. At $12^h\ 30^m$ *Mimas* was nearly over the preceding end of the ring; and *Enceladus* was very little short of his apparent conjunction south of the ball. In this position they were seen steadily and well with power 864, and without any contrivance to hide the splendour of the planet.

" *September 12th.* Most extraordinarily, to-night is also fine, making the fourth of almost unprecedented beauty. Two friends observing with me prevented my noting down the phenomena, as on the 9th and 10th, at the time of observation; and the record of what I saw was made on the following morning. About 11^h the telescope was turned upon *Saturn*, and we surveyed him with various powers, viz. 430, 560, 614, and 864, as the increasing altitude of the planet allowed us to see him through a thinner medium. The night was excessively dewy, the fields being covered with fog up to the tops of the hedges; and indeed the whole sky up to within a little of the zenith was hazy or foggy. This, however, cleared off later in the night, and from 13^h to 14^h *Saturn* appeared with unequalled beauty. *Enceladus* was watched up to the moment of his apparent inferior conjunction, which I estimated to take place at $13^h\ 59^m$ G.M.T.

" My impressions received this evening confirm in the fullest manner those described in the observations of the 9th and 10th

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instants. I could not perceive that there was any shading of deeper intensity than the rest in any part of the obscure portion of the ring, which I have usually called the 'crape veil.' Under the singularly favourable circumstances of these three evenings, (the state of the air being almost unprecedented, and the telescope with 20 and 22 inches aperture leaving nothing to desire in sharpness of definition), my attention has been directed in the most concentrated manner to the structure of the recently observed appendage of *Saturn*, which has been called the dark ring; and I arrive deliberately at the following conclusions:—That there is no evidence to me of any *division* between the 'crape veil' and the anterior portion of what has been hitherto considered the inner ring; though there is a faint shading, which begins about the middle of the bright inner ring, deepening towards the 'veil;' but even when it touches it, it is much less dark than the 'veil,' and it touches it without the intervention of any black division or sky between. And a careful survey of the whole surface of the veil on both sides of the ball shows me no irregularity of depth of shade, much less any *division* separating it into two.

"To perpetuate the impression of these telescopic visions of the planet I made a drawing of it as it appeared on the 10th of September, accompanied by the nearest two satellites. Of this drawing I have had a lithographic copy made, with as much faithfulness as I have been able to secure, some impressions of which accompany this paper.

"I must, however, acknowledge that it falls short of the beauty of the telescopic image; the drawing of the several ellipses of the boundaries of the rings not being quite symmetrical, especially the exterior outline on the north preceding side. The belt on the ball is also a little too dark, and its edges too hard. In other details it is pretty faithful; the kind of edge which appeared to me to form the exterior boundary of the veil, especially so."

On the Planet Saturn and his Rings. By Mr. Dawes.

"The night of October 26th (up to about $11^h 45^m$, when it suddenly clouded) was remarkable for distinctness of definition; and I employed part of it in examining the planet *Saturn* with high powers on my 8½-foot refractor. The results of the scrutiny were in some respects different from what I had ever seen before, and I hope they will not be uninteresting to the Society.

"The sky was hazy, the stars shining with a dim lustre ('*stellis acies obtusa*'). But on turning the telescope upon *Saturn*, I was struck with the beauty of the definition. A power of 585 (determined by measuring the emergent pencil) was borne with admirable distinctness, and the phenomena observed were as follows:

"On the *outer bright ring* was steadily visible a *very narrow*